



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: )  
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                            )  
                            Robert J. Fite         )                              Examiner: Younghui Han  
                            )  
                            )  
Serial No.:    09/476,219         )                              Group Art Unit: 2838  
                            )  
                            )  
Filed:          December 30, 1990         )                              Docket: 884.182US1  
                            )  
For:            NON-LINEAR ADAPTIVE         )  
                         VOLTAGE POSITIONING  
                         FOR DC-DC  
                         CONVERTERS                 )                              Customer No. 21186  
                            )  
Assignee:     Intel Corporation

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**APPEAL BRIEF UNDER 37 CFR § 41.37**

Mail Stop Appeal Brief--Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

This is in response to the Notification of Non-Compliance mailed by the U.S. Patent Office on November 22, 2004.

This brief is presented in support of the Notice of Appeal filed on May 21, 2004, from the final rejection of claims 1-16 of the above identified application. The Final Office Action from which the Appellant hereby appeals was mailed on April 20, 2004.

As requested in the Notification of Non-Compliance, the appeal brief is filed in triplicate. Authorization to charge Deposit Account No. 19-0743 to cover the fee for filing the appeal brief was given in the prior brief on appeal filed on August 23, 2004. Please charge any additional required fees or credit overpayment to Deposit Account 19-0743. Appellant respectfully requests reversal of the Examiner's rejection of pending claims 1-16.

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**APPEAL BRIEF UNDER 37 CFR § 41.37**

**TABLE OF CONTENTS**

	<u>Page</u>
1. REAL PARTY IN INTEREST .....	2
2. RELATED APPEALS AND INTERFERENCES .....	3
3. STATUS OF THE CLAIMS.....	4
4. STATUS OF AMENDMENTS .....	5
5. SUMMARY OF CLAIMED SUBJECT MATTER .....	6
6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL.....	7
7. ARGUMENT .....	8
8. SUMMARY .....	13
CLAIMS APPENDIX - The Claims on Appeal .....	14
EVIDENCE APPENDIX.....	18

**1. REAL PARTY IN INTEREST**

The real party in interest of the above-captioned patent application is the assignee, Intel Corporation, a corporation organized and existing under and by virtue of the laws of the State of Delaware, and having an office and place of business at 2625 Walsh Avenue, Santa Clara, California, 95051.

**APPEAL BRIEF UNDER 37 § 41.37**

Serial Number: 09/476,219

Filing Date: December 30, 1999

Title: NON-LINEAR ADAPTIVE VOLTAGE POSITIONING FOR DC-DC CONVERTERS

Assignee: Intel Corporation

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Page 3

Dkt: 884.182US1 (INTEL)

**2. RELATED APPEALS AND INTERFERENCES**

There are no appeals or interferences known to the Appellant which will have a bearing on the Board's decision in the present appeal.

### **3. STATUS OF THE CLAIMS**

Claims 1-16 are pending in the present application, and stand under Final Rejection. Claims 1-16 were rejected under 35 U.S.C. §112, first paragraph, under 35 U.S.C. §102(e) as being anticipated by Hua et al. (U.S. 5,999,433) or Buono (U.S. 5,949,222), and under 35 U.S.C. §102(e) as being anticipated by Yang et. al (U.S. 6,130,526).

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**Page 5**

Dkt: 884.182US1 (INTEL)

**4. STATUS OF AMENDMENTS**

No amendments are pending, and the status of the pending claims is reflected in the attached Appendix I, listing the claims on appeal.

## **5. SUMMARY OF CLAIMED SUBJECT MATTER**

A nonlinear adaptive voltage positioning DC-DC converter is provided in one embodiment, including a system and method (as shown by example in Figs. 3, 4, and 5, and the accompanying description on p. 5, ln. 5 - p. 7, ln. 24) for sensing a current drawn from the DC-DC converter, and adjusting the voltage provided from the DC-DC converter such that the voltage is at a maximum current voltage level when the current drawn is at a maximum load current level and the voltage is at a minimum current voltage level when the current drawn is at a minimum but nonzero load current level.

**6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

- I. Whether the drawings, specification, and amendments are proper.
- II. Whether Claims 1-16 are unpatentable under 35 U.S.C. 112, first paragraph.
- III. Whether Claims 1-16 are unpatentable under 35 USC §102(e) as being anticipated by Hua et al. (U.S. 5,999,433) or Buono (U.S. 5,949,222).
- IV. Whether Claims 1-16 are unpatentable under 35 USC §102(e) as being anticipated by Yang et. al (U.S. 6,130,526).

## 7. ARGUMENT

### **1) The Applicable Law**

As described in MPEP § 2164 et seq., the following represents the *prima facie* case that the Examiner must provide in order to maintain a rejection of nonenablement with respect to the disclosure of a patent application under 35 U.S.C. § 112, first paragraph:

1. a rational basis as to
  - a. why the disclosure does not teach, or
  - b. why to doubt the objective truth of the statements in the disclosure that purport to teach;
2. the manner and process of making and using the invention;
3. that correspond in scope to the claimed invention;
4. to one of ordinary skill in the pertinent technology;
5. without undue experimentation; and
6. dealing with subject matter that would not already be known to the skilled person as of the filing date of the application.

Anticipation under 35 U.S.C. 102(e) requires the disclosure in a single prior art reference of each element of the claim under consideration. *In re Dillon* 919 F.2d 688, 16 USPQ2d 1897, 1908 (Fed. Cir. 1990) (en banc), cert. denied, 500 U.S. 904 (1991). Anticipation further "requires the presence in a single prior reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*" *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added).

### **2) Discussion of the Rejections**

#### **I. Whether the drawings, specification, and amendments are proper.**

*Regarding the Drawings*

Applicant believes that the drawings as amended illustrate the elements of the pending claims discussed in the Office Action, and so has not amended the drawings. Figure 6 shows at 601 a module to adjust the voltage, and at 602 a module operable to sense a current. Converter 601 represents a hardware module, and Figures 7 and 8 describe methods as may be performed in software to practice the present invention.

Applicant points out that these drawings were previously filed in response to these same objections.

*Regarding the Specification*

Figure 6 is supported by the specification of the application as filed, as it was introduced for the primary purpose of illustrating elements of claims 9 and 10 in response to objections previously raised and as repeated above. Claim 9 recites “A DC-DC converter” show at 601 of Figure 6, “a module operable to sense a current drawn from the DC-DC converter” 602, and claim 10 recites “wherein adjusting the voltage in response to the sensed current is performed via hardware” element 603.

*Objection to the Amendments*

The Examiner objected to the amendments filed on June 17, 2002 and January 24, 2002 under 35 U.S.C. 132 because they introduced new matter into the disclosure.

Applicant respectfully submits that no filing was made on June 17, 2002 or on January 24, 2002. Applicant replied to a notice of noncompliant amendment on June 6, 2002, by simply repeating relevant portions of an amendment and response filed November 30, 2001. Applicant again assumes that the material filed November 30, 2001, is the material in question.

As described above, Figure 6 was not presented on the Applicant's own initiative, but was in response to an objection that elements of certain claims such as 9 and 10 were not shown

in the drawings. Applicant therefore introduced claim 6, which only shows these relevant elements, including claim 9's recitation of "A DC-DC converter" shown at 601 of Figure 6, "a module operable to sense a current drawn from the DC-DC converter" 602, and claim 10's recitation of "wherein adjusting the voltage in response to the sensed current is performed via hardware" element 603.

Applicant is further troubled by objections to Figure 6 and the accompanying description as containing new matter, when the same Office Action (mailed 4/20/2004) states on p. 3, second paragraph, that the newly proposed Figure 6 and accompanying amendment "do not provide any new insight as to how to make and how to use the claimed invention."

Applicant therefore submits that because previous Office Actions required applicant to introduce this drawing showing these elements that are clearly present in the claims, these elements are fully supported by the claims that originally disclosed these elements and do not add new matter. Applicant therefore respectfully requests withdrawal or reversal of the objections to the amendments as detailed above.

## II. Whether Claims 1-16 are unpatentable under 35 U.S.C. 112, first paragraph.

Applicant submits that the questions of enablement raised in the last Office Action, including specifically sensing an output current, are very well-known in the art. Further, examples are provided, such as on p. 7, ln. 27-30, which describes using a current sense resistor to sense output current. This section even goes on to explain application of Ohm's law, wherein the current is converted to a voltage drop across the current sense resistor of a known value and measured as a voltage.

Applicant further submits that adding voltages, sensing current through reading voltage across a resistor using Ohm's law, and other such basic electronic functions are very well-known

in the art, and are disclosed in many books on basic electricity and electronics, including as one example, *Horowitz and Hill, The Art of Electronics* (2<sup>nd</sup> ed, 1989, Cambridge University Press).

Because such subject matter would be known to any person skilled in the art without undue experimentation, and because the subject matter is disclosed by way of example provided in the Detailed Description, the pending claims 1-16 are believed to be allowable under 35 U.S.C. §112, first paragraph.

### **III. Whether Claims 1-16 are unpatentable under 35 USC §102(e) as being anticipated by Hua et al. (U.S. 5,999,433) or Buono (U.S. 5,949,222).**

Anticipation under 35 U.S.C §102 requires the disclosure in a single prior art reference of each element of the claim under consideration (*In re Dillon* 919 F.2d 688, 16 USPQ2d 1897, 1908 (Fed. Cir. 1990) (en banc), cert. denied, 500 U.S. 904 (1991)).

The rejection failed to point out specifically how the various elements of the pending claims are supposed to be anticipated by these references, except to state that both references show DC to DC converters that sense current and adjust voltage. The Examiner has failed to show in any Office Action how either the Hsu or Buono references cited contain any specific elements corresponding to claimed elements of the present invention.

More specifically, the Examiner has failed to show in any office action that the adjusting element or module of the pending claims that indicates a voltage is at a minimum current voltage level when the current drawn is at a minimum but nonzero load current level (*see, e.g.*, claim 1).

Because no Office Action has attempted to demonstrate how Hua or Buono anticipate the claims of the present invention, the claims are believed to be in condition for allowance under 35 U.S.C. §102(e). Reversal of the rejection of claims 1-16 is therefore respectfully requested.

**IV. Whether Claims 1-16 are unpatentable under 35 USC §102(e) as being anticipated by and Yang et. al (U.S. 6,130,526).**

Claims 1-16 were also rejected under 35 USC § 102(e) as being anticipated by Yang et al. (U.S. 6,130,526).

The Examiner has again failed to show in any office action how the cited Yang contain any specific elements corresponding to claimed elements of the present invention. More specifically, the Examiner has again failed to show that the adjusting element or module of the pending claims that indicates a voltage is at a minimum current voltage level when the current drawn is at a minimum but nonzero load current level.

Because no Office Action has attempted to demonstrate how Yang shows anticipation of the pending claims, the claims are believed to be in condition for allowance under 35 U.S.C. §102(e). Reversal of the rejection of claims 1-16 is therefore respectfully requested.

## 9. SUMMARY

Applicants believe the claims are in condition for allowance and request withdrawal of the rejections to the pending claims. It is respectfully submitted that the cited art neither anticipates nor renders the claimed invention obvious and that the claimed invention is therefore patentably distinct from the cited art. It is respectfully submitted that claims 1-16 should therefore be allowed, and reversal of the Examiner's rejections of pending claims 1-16 is respectfully requested.

Respectfully submitted,

ROBERT FITE

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.  
Attorneys for Intel Corporation  
P.O. Box 2938  
Minneapolis, MN 55402  
(612) 349-9581

Date

Jan 14 05

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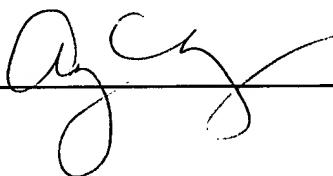
  
John M. Dahl  
Reg. No. 44,639

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Appeal Brief—Patents, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 14th day of January, 2005.

Name

Amy Moriarty

Signature



## **CLAIMS APPENDIX**

### The Claims on Appeal

1. (Previously Presented) A method of providing a voltage from a DC-DC converter such that the voltage provided varies dependent on the current drawn from the DC-DC converter, comprising:
  - sensing a current drawn from the DC-DC converter; and
  - adjusting the voltage provided from the DC-DC converter such that the voltage is at a maximum current voltage level when the current drawn is at a maximum load current level and the voltage is at a minimum current voltage level when the current drawn is at a minimum but nonzero load current level.
2. (Original) The method of claim 1, further comprising adjusting the voltage provided from the DC-DC converter to provide a substantially linear voltage response with respect to current drawn between the maximum load current level and the minimum load current level.
3. (Original) The method of claim 1, further comprising adjusting the voltage provided from the DC-DC converter such that the voltage is at the minimum current voltage level when the current drawn is below the minimum load current level.
4. (Original) The method of claim 1, wherein the minimum load current level is the minimum current drawn by a known load device having a minimum current draw of greater than no current.

5. (Original) The method of claim 1, wherein the minimum load current level is a selected current level between but not including no current and the maximum load current level.
6. (Original) The method of claim 1, wherein sensing a current drawn from the DC-DC converter comprises sensing the voltage across a current sensing resistor connected in series with an output of the DC-DC converter.
7. (Previously Presented) A method of providing a voltage from a DC-DC converter such that the voltage provided varies dependent on the current drawn from the DC-DC converter, comprising:
  - sensing an output current drawn from the DC-DC converter;
  - converting the sensed output current to a voltage signal indicating the sensed output current;
  - adjusting the voltage signal indicating the sensed output current such that the voltage is at a minimum level when the current drawn is at a maximum load current level and the voltage is at a maximum level when the current drawn is at a minimum but nonzero load current level; and
  - adding the adjusted voltage signal to the voltage provided by the DC-DC converter.
8. (Previously Presented) A method of providing a voltage from a DC-DC converter such that the voltage provided varies dependent on the current drawn from the DC-DC converter, comprising:
  - sensing an output current drawn from the DC-DC converter;
  - converting the sensed output current to a voltage signal indicating the sensed output current;
  - adjusting the voltage signal indicating the sensed output current such that the voltage is at a maximum current voltage level when the current drawn is at a maximum load current level and

the voltage is at a minimum current voltage level when the current drawn is at a minimum but nonzero load current level; and

subtracting the adjusted voltage signal from the voltage provided by the DC-DC converter.

9. (Previously Presented) A DC-DC converter, comprising:

a module operable to sense a current drawn from the DC-DC converter and further operable to adjust the voltage provided from the DC-DC converter such that the voltage is at a maximum current voltage level when the current drawn is at a maximum load current level and the voltage is at a minimum current voltage level when the current drawn is at a minimum but nonzero load current level.

10. (Original) The DC-DC converter of claim 9, wherein adjusting the voltage in response to the sensed current is performed via hardware.

11. (Original) The DC-DC converter of claim 9, wherein adjusting the voltage in response to the sensed current is performed via software executing on a processor.

12. (Original) The DC-DC converter of claim 9, wherein sensing a current drawn from the DC-DC converter comprises measuring the voltage across a current sensing resistor connected in series with an output of the DC-DC converter.

13. (Original) The DC-DC converter of claim 9, wherein the module is further operable to provide a substantially linear voltage response with respect to current drawn between the maximum load current level and the minimum load current level.

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14. (Original) The DC-DC converter of claim 9, wherein the module is further operable to provide a voltage at the minimum current voltage level when the current drawn is below the minimum load current level.
  15. (Original) The DC-DC converter of claim 9, wherein the minimum load current level is the minimum current drawn by a known load device having a minimum current draw of greater than no current.
  16. (Original) The DC-DC converter of claim 9, wherein the minimum load current level is a selected current level between but not including no current and the maximum load current level.

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**Page 18**

Dkt: 884.182US1 (INTEL)

**EVIDENCE APPENDIX**

None.